



1200 Nineteenth Street, N.W.  
Washington, D.C. 20036-2412  
www.piperrudnick.com

PHONE (202) 861-3900  
FAX (202) 861-3877

## WRITER'S INFORMATION

steven.kelber@piperrudnick.com  
PHONE(202) 861-6675  
FAX(202) 861-3877

December 18, 2001

**URGENT  
REPLY REQUESTED**

Commissioner of Patents and Trademarks  
Washington, DC 20231

ATTN: Mr. Michael Carone  
Licensing and Review

Re: U.S. Patent Application  
Serial No.: 09/975,257  
Entitled: "A NOVEL SELF MONITORING PROCESS FOR ULTRA THIN  
GATE OXIDATION"  
Inventor(s): Sundar NARAYANAN, et al.  
Our Ref: 8229-013-27

Dear Mr. Carone:

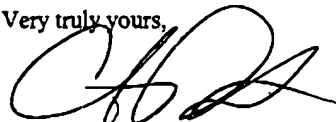
In response to the Form PTOL-456 mailed on November 7, 2001, please note that there is no disclosure of "special nuclear material" in the specification of the above-identified application. We believe that this application was flagged as relating to atomic energy because of the disclosure in the specification of an analytical technique called "nuclear reaction analysis" (See page 11, lines 14-15 of the specification, attached). Nuclear Reaction Analysis (NRA), however, is a conventional analytical technique for determining the composition of a layer. The application is directed to the field of semiconductor processing and not to an invention "useful in the production or utilization of special nuclear material" under 42 USC § 2182.

Accordingly, we respectfully request that the requirement for the filing of a property rights statement be withdrawn in the above cited application. We look forward to prompt receipt of confirmation, prior to **December 21, 2001**, that no response is required pursuant to Paper No. 2.

Mr. Michael Carone  
December 18, 2001  
Page 2

If you have any questions, or need any further information please do not hesitate to contact us.

Very truly yours,



Steven B Kelber  
Christopher W. Raimund

Enclosures

PTOL-456 (copy)

Page 11 of U.S. Patent Application No. 09/975,257


**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patents and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
 Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
09/975,257	10/12/01	NARAYANAN, ET AL.	8229-013-27

 SUPERVISOR, PATENT PROSECUTION SERVICES  
 PIPER MARBURY RUDNICK & WOLFE LLP  
 1200 NINETEENTH STREET, N.W.  
 WASHINGTON, DC 20036-2412

 PIPER MARBURY RUDNICK & WOLFE LLP  
 RUDNICK & WOLFE LLP

NOV 09 2001

EXAMINER	
ART UNIT	PAPER NUMBER
	2

DATE MAILED: 11/07/01

 Atomic  
 Energy Statement  
 Due: 12/21/2000

**IF NO RESPONSE TO THIS NOTICE IS RECEIVED WITHIN FORTY-FIVE DAYS, A  
 FORMAL REQUIREMENT WILL BE ISSUED**

The subject matter of this application appears to:

☒ be "useful in the production or utilization of special nuclear material or atomic energy" as recited in 42 U.S.C. 2182 (Department of Energy (DOE)).

☐ "have significant utility in the conduct of aeronautical and space activities" as recited in 42 U.S.C. 2457 (National Aeronautics and Space Administration (NASA)).

Accordingly, no patent can issue on this application unless applicant(s) file a statement (under oath or in the form of a declaration as provided by 37 CFR 1.68) setting forth (1) the full facts concerning the circumstances under which the invention was made and conceived and (2) the relationship (if any) of the invention to the performance of any work under any contract or other arrangement with the Agency(ies) noted above. On the reverse side of this form is an example of an acceptable format for this statement. The language appearing in paragraphs III and/or IV of the example must appear if applicant is attempting to establish that no relationship (under item 2 above) exists.

If the invention disclosed in this application was developed under a contract, grant or cooperative agreement between the Agency indicated above and a person, small business or non-profit organization and rights to the invention have been determined by specific reference to 35 U.S.C. 202 in the contract, grant or cooperative agreement, then applicant need not submit the statement described above. Instead, applicant may file a verified statement (under oath or in the form of a declaration, 37 CFR 1.68) setting forth the information required by 35 U.S.C. 202(c)(6).

IF NO STATEMENT HAS BEEN RECEIVED WITHIN FORTY-FIVE DAYS OF THE MAIL DATE INDICATED ABOVE, a formal requirement for statement will then be issued. No provision is made for extension of the statutory thirty-day period for response to the formal requirement and the penalty for failure to file an acceptable and timely statement is abandonment of the application. Therefore, applicants are strongly encouraged to submit a statement at this time in order to avoid the issuance of a formal requirement.

IT IS IMPORTANT TO NOTE that the statement must accurately represent the property rights situation of the claimed invention if and when the application is found allowable. Thus, if during prosecution before the examiner, the claimed invention is so altered or the property rights situation so changed as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. Failure to submit such additional information where appropriate may be considered a false representation of material facts and render the patent owner vulnerable to loss of patent rights and other sanctions as set forth in the statutes. The PTO will not review allowed applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

Any questions regarding this requirement should be directed to Licensing and Review at (703) 306-4191.

**PLEASE DIRECT ALL COMMUNICATIONS RELATING TO THIS MATTER TO THE  
 ATTENTION OF LICENSING AND REVIEW**

thickness according to the invention can also be estimated. For example, the initial gate oxide thickness can be estimated from gate oxide thickness data previously collected for the initial oxide formation process. The previously collected data can be data taken under the same process conditions. Alternatively, the previously collected data can be data taken under different process conditions and the estimate can be interpolated or extrapolated therefrom.

According to the invention, the thickness or change in thickness during oxidation of the oxidized nitrided gate oxide layer can be correlated to the nitrogen content of the gate oxide layer. A calibration curve for the nitrogen content as a function of the measured thickness or the calculated change in thickness can then be generated for the reoxidation conditions being employed in the furnace or RTP. The nitrogen content of the samples used to generate the calibration curve can be determined using standard analytical techniques such as secondary ion mass spectroscopy (SIMS). Other techniques known in the art such as nuclear reaction analysis (NRA), medium energy ion scattering (MEIS), x-ray photoelectron spectroscopy (XPS), Auger electron spectroscopy (AES), Fourier transform infrared spectroscopy (FTIR), and spectroscopic ellipsometry can also be employed.

FIG. 2 is a graph showing the change in thickness of the oxidized nitrided gate oxide layer in angstroms plotted as a function of the nitrogen content of the nitrided gate oxide layer. As can be seen from FIG. 2, the change in thickness of the oxidized nitrided gate oxide layer decreases with increasing nitrogen content of the gate oxide layer. A least squares regression analysis produced a linear fit to the data as set forth below:

\*\*\*\*\*  
\*\*\* ACTIVITY REPORT \*\*\*  
\*\*\*\*\*

RECEPTION OK

TX/RX NO.	1888
CONNECTION TEL	2028613925
CONNECTION ID	
START TIME	12/18 15:17
USAGE TIME	01'44
PAGES	5
RESULT	OK

## Facsimile Transmission Sheet

PIPER  
MARBURY  
RUDNICK  
& WOLFE LLP

1200 Nineteenth Street, N.W.  
Washington, D.C. 20036-2412  
www.piperrudnick.com

PHONE (202) 861-3900  
FAX (202) 861-3877

## SENDER'S INFORMATION:

Steven B. Kelber  
Christopher W. Raimund

PHONE (202) 861-6675  
(202) 861-3896

## E-MAIL

steven.kelber@piperrudnick.com  
christopher.raimund@piperrudnick.com

To:	Mr Michael Carone, Licensing and Review
Company:	U.S. Patent and Trademark Office
Phone:	(703) 306-4191
Fax:	(703) 306-4196
Re:	Letter of Explanation Regarding PTOL-456
Date:	December 18, 2001
Number of Pages (including fax sheet):	5
Attorney Number	11475
Client/Matter Number	301435-13 (8229-013-27)
Your Reference	09/975,257

Original ☐ will / ☒ will not follow.

The information contained in this facsimile message is confidential and, if addressed to our client or certain counsel, is subject to the attorney-client or work product privilege, and is intended only for the use of the individual or entity named above. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone, and return the original message to us at the above address via the U. S. Postal Service.

## Comments:

**URGENT REPLY REQUESTED**

ok to  
withdraw  
rights properly  
2/1/02  
12/18/01